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SESSION 2: INSTITUTIONAL STRATEGIES FOR IMPLMENTING RESEARCH-BASED EDUCATION

Presentation for the *HERE seminar "Implementing Research Based Education"*
Venue: Rectorate of the University of Montenegro
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The Importance of RBE...

- **Employability:** *higher education for the 21st Century: graduate skills for the knowledge/information society* (e.g. Healey/Jenkins, 2009)

- **Teaching for quality**: *the shift from teaching to learning in Higher Education* (e.g. Boyer, 1999)

- **Strengthening our institutions**: *recruiting and retaining the next generation of research scientists* (e.g. HRK, 2002; German Council of Science and Humanities, 2008)

…questioned:

- **Employability** -> *Do all our graduates become research scientists?*

- **Educating students to become independent (life-long) learners** -> *Is RBL the only way or most efficient way to acquire 21st Century skills?*

- **Teaching for quality**-> *More a battle for scarce resources?*

The Institutional Perspective: What do you want from RBE?(Basic questions)

- **What qualities do you want University of Montenegro graduates to possess?**
  - What role does research play in this (and at what level)?

- **What types of careers are you educating and training your students for?**
  - This may be different for the each degree programme

What can RBE do for you?

- **Enhance the student experience** -> *RBL is one of many approaches to create a more active and student centred curriculum*

- **Identify potential scientific research talent** -> *a supplementary undergraduate research opportunities (UROP) scheme might achieve this*

- **Make the 'unity of research and teaching' part of your institutional profile** -> *RBL is one way forward*

Case 1 - Enhancing the Curriculum Through Undergraduate Research/Inquiry-Based Learning

Complexity

Evidence-Based Learning

Problem-Based Learning

Project-Based Learning

Research-Based Learning

Service Learning

Staff project

Own project

Time

Evidence-Based Learning

Process (model)

- Students in class are given a short scenario that requires them to come to a decision based on subject-specific evidence
- They discuss the problem and interpret the evidence
- They arrive at a decision based on evidence
- They discuss their decision and the reasoning behind it with their class
- They receive feedback from their peers and their tutor (+ model solution)

Skills

- Limited data/Evidence interpretation
- Reasoning
- Decision-making
- Communication

Problem-Based Learning

Process (model)

1. Members of the class (10-15) students are set up in groups
2. Clarification: students define the problem
3. They generate ideas, identify what is known and what isn't
4. They identify learning steps for solving the problem
5. Students work individually towards the solution
6. The groups bring together their individual findings and report back to class
7. Class reflects on the results and the process, receives feedback from the tutor

Skills (examples)

- Generation of hypotheses
- Identification of resources available and required
- Information retrieval
- Synthesizing information
- Formal and informal communication
- Teamwork
- Time-management (usually in class)
- Decision-making
- Reflexion/Feedback

Project-Based Learning

Process (model)

1. Groups are given larger scale task or problem to work on outside of class
2. They agree on the steps needed to solve the task or problem (division of labour, goals)
3. Individuals get together regularly to update the rest of their team on progress made. They may seek feedback from the tutor. (Class time is set aside for supporting the groups)
4. The group prepares their results to report back to class, including reflections on the process
5. Class reflects on the results and the process, receives feedback from the tutor

Skills (examples)

- Generation of hypotheses
- Identification of resources available and required
- Information retrieval
- Synthesizing information
- Formal and informal communication
- Teamwork
- Goal-setting
- Project-management
- Decision-making
- Reflexion/Feedback

Service Learning
(Projects with/for external parties)

Process (model)

1. A ‚client' (company, NGO, community organisation) approaches the tutor with a real problem
2. The group meets with the client to discuss the parameters of the project
3. The group devises and presents a solution to the client

(competitive version)
3. Groups devise different solutions for the client and ‚pitch' them against each other
4. Class reflects on the results and the process, receives feedback from the tutor

Skills (examples)

- Generation of hypotheses
- Identification of resources available and required
- Information retrieval
- Negotiation
- Teamwork
- Expectation-management
- Project-management
- Decision-making
- Reflexion/Feedback

Research-Based Learning
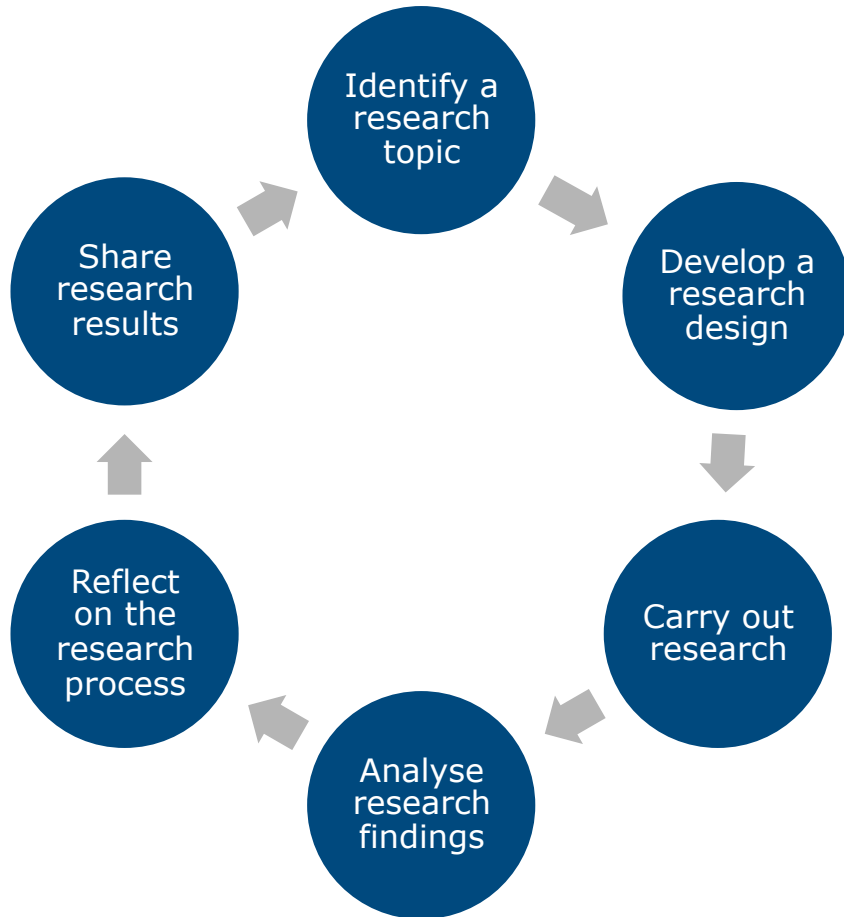
Skills (examples)

- Application of theoretical and methodological knowledge

- Ability to generate ‚new' knowledge/information

- Reflect on the potential and limitations of research design and findings

- Act as responsible members of the scientific community

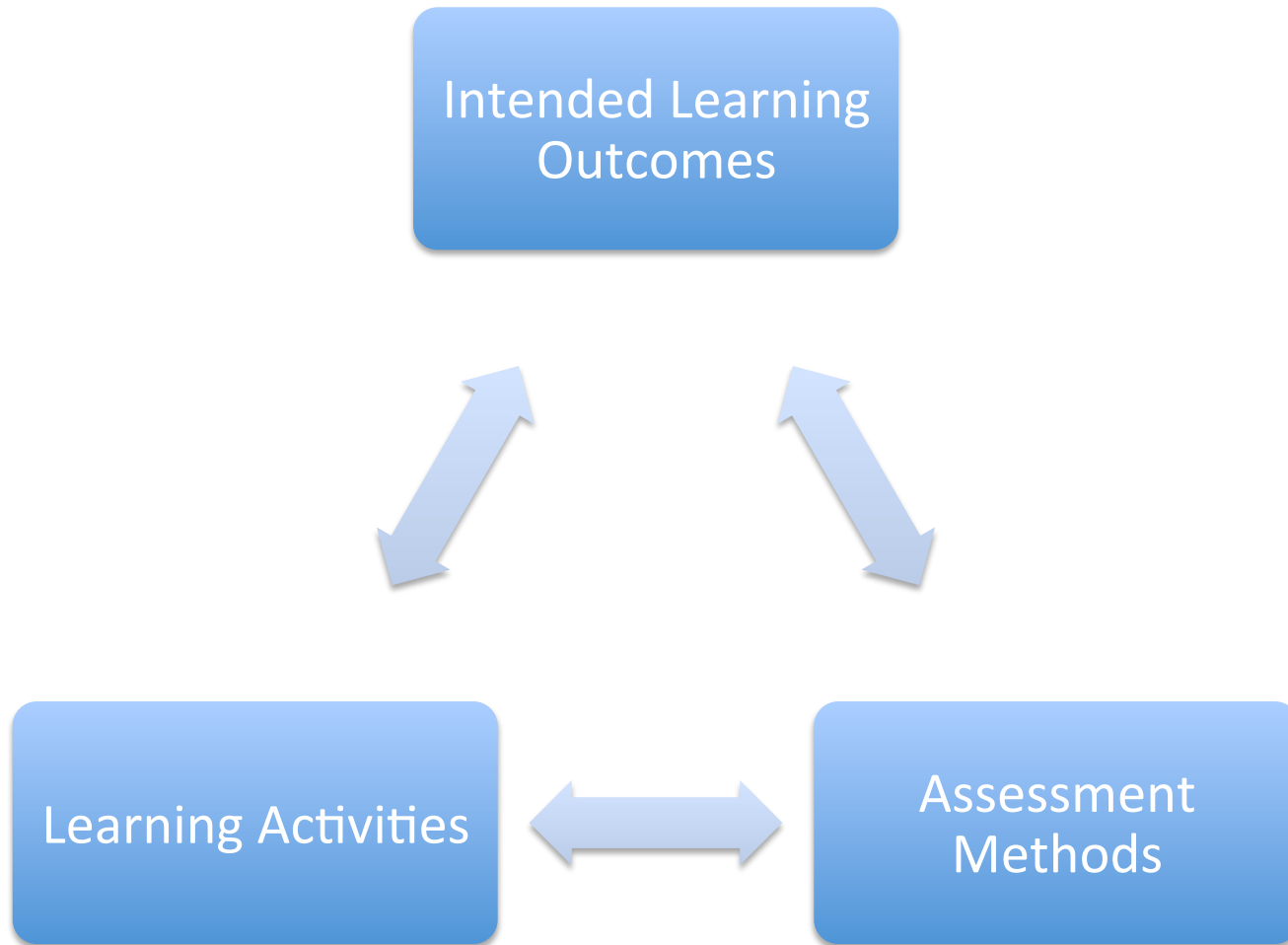# Changing our Approach to Teaching: From Instructor to Mentor?

	Traditional Teaching	Research-based learning
Goal	Successful (testable/ demonstrable) transmission of knowledge	Independent acquisition of knowledge and an understanding of how knowledge is produced
Subject	Predetermined (set curricula, exam format and subjects)	Ideally chosen by the students, often with direct connection to the student's interests
Role/ Relation-ship	Asymmetrical and hierarchical – the teacher 'knows', is active, the student does not know, is passive-receptive	(More) symmetrical: student and teacher are both active researchers, the teacher uses experience to act as mentor and adviser
Motivation	Extrinsic and instrumental (compulsory attendance, grades, professional entry requirements)	Intrinsic, interest in the subject, in learning itself and in research as a process

Rueß, Gess & Deicke (2013) An Attempt to Sharpen the Concept of Research-Based Learning

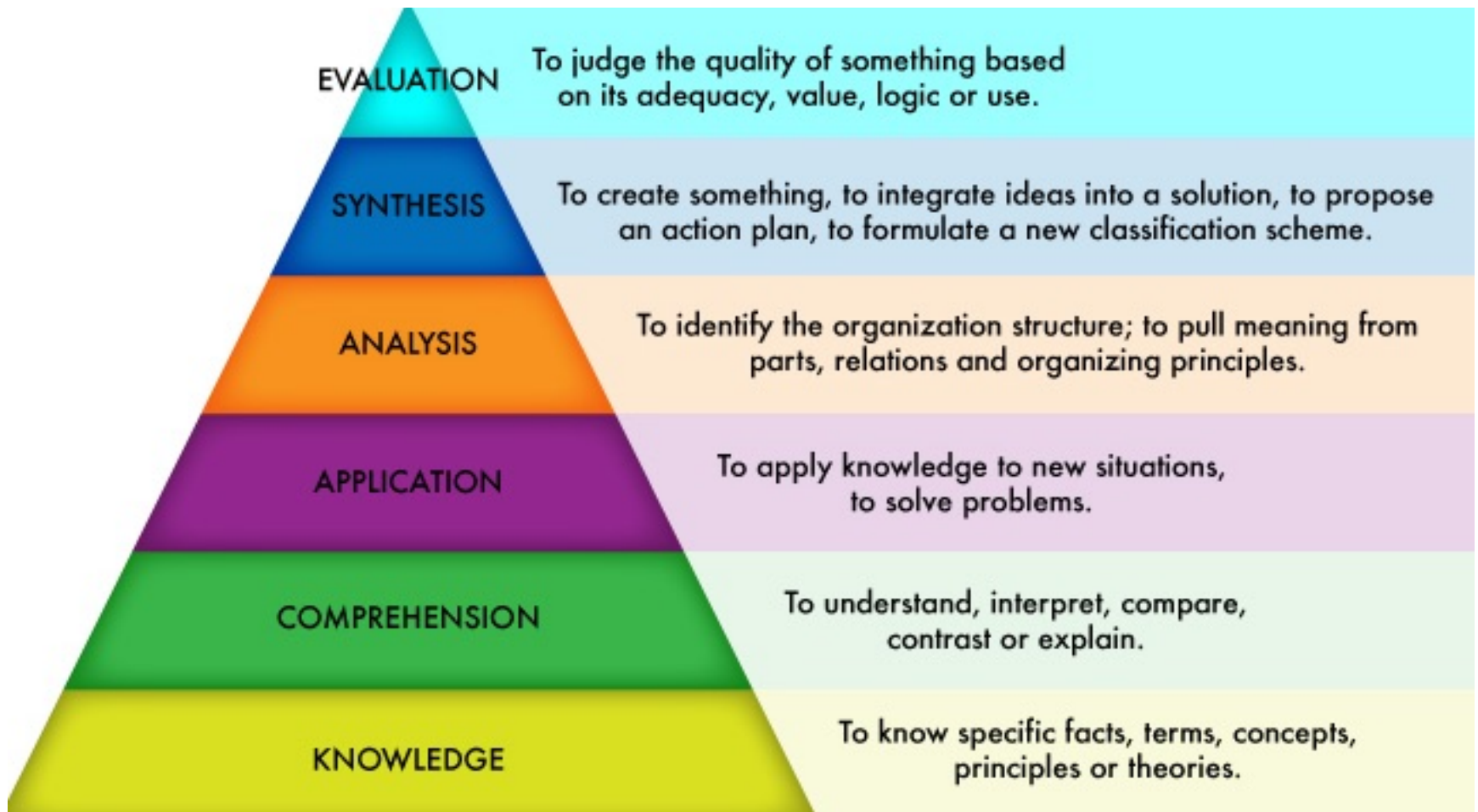|	Research results	Research methods	Research process
learning by research	... conduct a literature search on a research topic (A3)	... apply a chosen method to a given research problem (B3)	... conduct their own research project (full cycle) (C3)
applied learning	... discuss research findings (A2)	... discuss pros and cons of particular methods (B2b) ... practice methods (B2a)	... discuss research designs (C2b) ... develop research questions or designs (C2a)
receptive learning	... are presented research findings (A1)	... are taught research methods (B1)	... are taught about the research process (C1)

Source: Rueß, Gess, Deicke (2013) *Schärfung des Konzepts Forschenden Lernens...*

Biggs (2003): Constructive Alignment in Curriculum Design

Adapted from: Biggs (2003)

Bloom's Taxonomy

EVALUATION — To judge the quality of something based on its adequacy, value, logic or use.

SYNTHESIS — To create something, to integrate ideas into a solution, to propose an action plan, to formulate a new classification scheme.

ANALYSIS — To identify the organization structure; to pull meaning from parts, relations and organizing principles.

APPLICATION — To apply knowledge to new situations, to solve problems.

COMPREHENSION — To understand, interpret, compare, contrast or explain.

KNOWLEDGE — To know specific facts, terms, concepts, principles or theories.

Source: https://www.uaa.alaska.edu/studentaffairs/assessment/images/Bloom-s-Taxonomy.jpg

Towards an Institutional Strategy: The Challenges of RBE/Undergraduate Research

- **At the institutional level**: *curriculum design as a resource issue (staff hours, staff expertise, staff development/training, rooms, equipment)*

- **At faculty/departmental level**: *curriculum design as cultural change, team building, careful resource management, maintaining curricular coherence*

- **At staff level:** *a change in teaching style, loss of ‚control' over the curriculum*

References:

Biggs, J. (2003). *Teaching for Quality Learning at University. Buckingham: Society for Research into Higher Education/OUP*

Rueß, J., Gess, C. & Deicke, W. (2013) *‚Schärfung des Konzepts des Forschenden Lernens im Kontext forschungsbezogener Lehre‘,* paper presented at ‚Konferenz Forschendes Lernen: Forum für gute Lehre‘ am 2. September 2013 in Potsdam.